DIRECTIONAL ANTENNA SECTORING SYSTEM AND METHODOLOGY

WHAT IS CLAIMED IS:

1. A wireless system for transmitting and receiving a plurality of data packets, the system comprising:

a plurality of directional antenna sectors each having a respective associated three-dimensional region of space for transmitting and receiving electromagnetic signals;

at least one receiving controller;

at least one transmitting controller;

wherein at least one of said receiving controllers is selectively coupled to at least one of the directional antenna sectors to measure received electromagnetic signal characteristics;

wherein at least one of said receiving controllers selects at least one of the directional antenna sectors prior to the transmission of at least one data packet responsive to the received electromagnetic signal characteristics; and

wherein at least one of said transmitting controllers is selectively coupled to at least one of the directional antenna sectors in order to transmit at least one data packet via the directional antenna sectors selected by said selected one of said at least one receiving controller.

2. The system as in Claim 1, wherein a selected one of said at least one receiving controller is selectively coupled to selected ones of the directional antenna sectors in a defined order in order to measure received electromagnetic signal characteristics.

3. The system as in Claim 1, wherein a selected one of said at least one receiving controller prior to the transmission of at least one data packet selects at least one of the directional antenna sectors within a first defined time interval responsive to the received electromagnetic signal characteristics.

4. The system as in Claim 1, wherein a selected one of said at least one receiving controller selects at least one of the directional antenna sectors within an order dependent upon history of the received electromagnetic signal characteristics prior to the transmission of at least one data packet.

5. The system as in Claim 1, wherein the plurality of directional antenna sectors are part of at least one of: a mobile device, a laptop computer, a desktop computer, a personal digital assistant (PDA), a cordless phone, a wireless phone, a cellular phone, a 2.5G cellular phone, a 3G device, a 4G device, a 5G device, a multimedia device, a GPS (global positioning system) receiver, an electronic book, electronic paper, an automotive, a boat, a ship, an airplane, a train, a satellite, a hand-held device, a base station, an access point, an access router, a UAV (unmanned aerial vehicle), and a packet switch output.

6. The system as in Claim 1, wherein the receiving controller is part of at least one of: a mobile device, a laptop computer, a personal digital assistant, a cordless phone, a wireless phone, voice-over IP, a RFID (radio frequency identifier), a cellular phone, a 2.5G cellular phone, a 3G device, a 4G device, a 5G device, a multimedia device, a GPS (global positioning system) receiver, an electronic book, electronic paper, and a packet switch.

7. The system as in Claim 1, wherein at least one of the plurality of directional antenna sectors are polarized antennas, and

wherein each said polarized antenna sector transmits an electromagnetic signal in a defined polarization.

8. The system as in Claim 1, wherein each said directional antenna sector transmits in a defined direction that is defined by physical construction of the respective directional antenna sector.

9. The system as in Claim 8, wherein each said directional antenna sector is associated with a respective transmission region in three-dimensional space; and

wherein the respective transmission regions in three-dimensional space are overlapped within defined parts of three-dimensional space.

10. The system as in Claim 9, wherein the respective transmission regions in three-dimensional space are defined with accordance to 3db power lobes.

11. The system as in Claim 1, wherein selected ones of the directional antenna sectors are steered antennas, wherein the steered antennas receive and transmit electro-magnetic signals within a defined region in at least one of: two-dimensional space and three-dimensional space.

12. The system as in Claim 11, wherein the steered antenna sectors are moveable by at least one of: a step-motor, an electric motor, an electric field, a magnetic field, and a phase array.

13. The system as in Claim 1, wherein the directional antenna sectors are arranged in a predefined pattern; and

wherein the predefined pattern is at least one of: polyhedron, polygon, octahedron, pentagon, cube, pyramid, sectorized cylinder, ball, pentagondodecahedron, and icositetrahedron.

14. The system as in Claim 1, wherein there is a plurality of receiving controllers, the system further comprising:

a receiving switch; and

wherein selected ones of the receiving controllers are selectively coupled to selected ones of the directional antenna sectors utilizing the receiving switch.

15. The system as in Claim 14, wherein the receiving switch is constructed by utilizing high impedance amplifiers.

16. The system as in Claim 14, further comprising:

a plurality of receiver radio frequencies devices (RRFs);

wherein the receiving switch has N inputs and R outputs;

wherein the N inputs are selectively connected to the directional antenna sectors; and

wherein the R outputs are selectively connected to selected ones of the plurality of the RRFs.

17. The system as in Claim 1, wherein there are a plurality of receiving controllers, and wherein there are a plurality of the transmitting controllers, the system further comprising:

an RF switch,

wherein selected ones of the receiving controllers are selectively coupled to selected ones of the directional antenna sectors utilizing the RF (radio frequency) switch; and

wherein selected ones of the transmitting controllers are selectively coupled to at least one of the directional antenna sectors utilizing the RF switch.

18. The system as in Claim 1, wherein there is a plurality of the transmitting controllers, the system further comprising:

a transmitting switch; and

wherein selected ones of the transmitting controllers are selectively coupled to at least one of the directional antenna sectors utilizing the transmitting switch.

19. The system as in Claim 18, wherein the transmitting switch is comprised of high impedance amplifiers.

20. The system as in Claim 18, further comprising:

a plurality of transmitter radio frequencies devices (TRFs);

wherein the transmitting switch has T inputs and N outputs;

wherein the N outputs are selectively connected to the directional antenna sectors, and

wherein the T inputs are connected to selected ones of the plurality of the TRFs.

21. The system as in Claim 1, wherein there are a plurality of the receiving controllers, and wherein each of the plurality of the receiving controllers is selectively coupled to selected ones of the directional antenna sectors in at least one of: a random order and a defined order for providing for measurement of the received electromagnetic signal characteristics.

22. The system as in Claim 1,wherein there are a plurality of the receiving controllers, and wherein selected ones of the receiving controllers are selectively coupled to selected ones of the directional antenna sectors in at least one of the following patterns: reoccurring, one at a time, two at a time, three at a time, bisection, opposite directions, intersecting sets.

23. The system as in Claim 1, wherein the received electromagnetic signal characteristics are provided as signals comprising control information and data information.

24. The system as in Claim 23, wherein the control information is representative of at least one of: RSSI (received signal strength indicator), power, polarization, SNR (signal-to-noise-ratio), Doppler shift, packet source identification, transmitting identification, base station identification, access point identification, bit error-rate, phase-shift, wherein the control information is processed to determine the received electro-magnetic characteristics.

25. The system as in Claim 23, wherein the received electromagnetic signal characteristics are determined by at least one of the following: RSSI (received signal strength indicator) analysis, analog processing, digital processing, analog filtering, digital filtering, FEC (forward error correction), bit error-rate analysis, time-of-day analysis, propagation delay analysis, transmitter address analysis, and transmitter identification analysis.

26. The system as in Claim 23, wherein the control information is used by a selected one of the receiving controllers to select at least one of the plurality of directional antenna sectors.

27. The system as in Claim 1, further comprising:

an antenna control unit; and

wherein the control information is used by the antenna control unit to select at least one of the plurality of directional antenna sectors.

28. The system as in Claim 1, wherein the directional antenna sectors are physically arranged into a shape having a plurality of facets, wherein each directional antenna sector transmits electromagnetic signals in a defined direction in three-dimensional space, and

wherein the defined direction in three-dimensional space is at least one of: perpendicular to a polyhedron facet, perpendicular to a pyramid facet, perpendicular to a cube facet, a predefined angle with respect to a polyhedron facet, a predefined angle with respect to a pyramid facet, a predefined angle with respect to a cube facet, a predefined angle with respect to a octahedron facet, and a predefined angle with respect to a pentagondonecahedron facet.

29. The system as in Claim 23, further comprising:

means for detecting an identification source of the received electromagnetic signal responsive to the control information;

wherein there is a plurality of the receiving controllers;

wherein a selected one of the receiving controllers selects at least one of the directional antenna sectors prior to transmission of at least one data packet and responsive to the received electromagnetic signal characteristics and the identification of the source of the received electromagnetic signal;

wherein there are a plurality of the transmitting controllers; and

wherein a selected one of the transmitting controllers is selectively coupled to at least one of the directional antenna sectors to transmit at least one data packet as selected by the selected one of the receiving controllers.

30. The system as in Claim 29, wherein the identification source is at least one of: a wireless access point, a base station, a cellular phone base station, a mobile device, an 802.11 device, an 802.15 device, an 802.16 device, a laptop computer, a desktop computer, a personal digital assistance, and a cellular phone.

31. A wireless device for transmitting and receiving a plurality of data packets, the system comprising:

a first buffer providing memory for storage;

a plurality of directional antenna sectors each associated with a respective three-dimensional region in space for transmitting and receiving electromagnetic signals;

at least one receiving controller;

at least one transmitting controller;

wherein each directional antenna sector is selectively coupled to a selected one of the at least one said transmitting controller and transmits an electromagnetic signal in a defined region in space;

wherein a selected one of the at least one said receiving controller is selectively coupled to at least one of the directional antenna sectors to measure received electromagnetic signal characteristics and stores the electromagnetic signal characteristics in the first buffer, and

wherein the selected one of the at least one said transmitting controllers is selectively coupled, to at least one of the directional antenna sectors for a first defined time interval for the transmission of at least one data packet responsive to the received electromagnetic signal characteristics stored in the first buffer.

32. The system as in Claim 31, wherein at least one of the at least one said receiving controller is coupled to at least one of the directional antenna sectors for a second defined time interval for receiving of at least one data packet, responsive to the received electromagnetic signal characteristics stored in the first buffer.

33. The system as in Claim 31, wherein the at least one said receiving controller is selectively coupled to the directional antenna sectors in a defined order responsive to the electromagnetic signal characteristics stored in the first buffer.

34. The system as in Claim 31, wherein the at least one said receiving controller is selectively coupled to the directional antenna sectors in at least one of the following patterns, responsive to the electromagnetic signal characteristics stored in the first buffer as at least: one directional antenna sector at a time, two directional antenna sectors at a time, three directional antenna sectors at a time.

35. The system as in Claim 31, further comprising:

a wireless device contains at least one of: the plurality of antenna sectors, the receiving controller; the transmitting controller and the first buffer; and

an antenna system comprises at least one of: the plurality of directional antenna sectors, the at least one said receiving controller; the at least one said transmitting controller and the first buffer.

36. The system as in Claim 35, wherein the wireless device and the antenna system are coupled to each other by at least one of the following: a plurality of coax cables, a multi-lead coax cable, a parallel data connection, serial data connection, a parallel data and control connection, a parallel data, a timing and control connection, a PCMCIA (personal computer memory card international association) interface, a USB (universal serial bus) interface, an IEEE 1394 (Fire-Wire) interface, an infra red (IR) interface, a free space optical laser interface, and a wireless interface.

37. The system as in Claim 35, further comprising:

an access control unit for managing the transmitting and receiving of the data packets, and

wherein the access control unit is part of at least one of: the wireless device and the antenna system.

38. The system as in Claim 35, further comprising:

an antenna control unit for managing selection of the directional antenna sectors;

wherein the antenna control unit is part of at least one of: the wireless device and the antenna system; and

wherein the antenna control unit processes the received electromagnetic signal characteristics stored in the first buffer to select at least one of the directional antenna sectors for the first predefined time interval for transmission of data packets.

39. The system as in Claim 38, wherein the antenna control unit performs parts of at least one of the following protocols: IEEE 802.11, IEEE 802.15, IEEE 802.16, CDMA 2000, WCDMA, UMTS, GPRS, 2.5G, 3G, 4G, 5G, and GSM.

40. The system as in Claim 35, wherein the wireless device is part of at least one of the following: a laptop computer, a personal computer, a personal digital assistant, a cellular phone, a 2.5G cellular phone, a 3G device, a 4G device, a consumer electronic game, a multimedia device, a videoconferencing system, a wireless packet audio system, a wireless packet video system, an electronic book, a home entertainment system, electronic paper, a GPS (global positioning system) receiver, an automotive, a boat, a ship, an airplane, a trains, a satellite, a hand-held device, a base stations, a wireless access point, an access router, an electronic scanner, a UAV (unmanned aerial vehicle), and a packet switch.

41. The system as in Claim 31, further comprising:

at least one omni antenna, and

wherein the at least one said omni antenna is coupled to at least one of the following: said at least one said receiving controller and said at least one said transmitting controller.

42. The system as in Claim 31, wherein each of the directional sector antennas is selected from at least one of the following types: flat panel, parabolic dish, slotted, micro-strip, yagi, omni, and planar.

43. A wireless method for transmitting and receiving a plurality of data packets, the method comprising:

orienting a plurality of directional antenna sectors in three-dimensional space;

selecting at least one of said plurality of directional antenna sectors to receive an electromagnetic signal;

coupling at least one of said selected directional antenna sectors to receive an electromagnetic signal;

measuring electromagnetic signal characteristics of the received electromagnetic signal;

selecting at least one of said plurality of directional antenna sectors to transmit an electromagnetic signal;

coupling at least one of said selected directional antenna sectors to transmit a transmitted electromagnetic signal; and

transmitting the electromagnetic signal as a transmitted signal in a defined region in space prior to transmitting of at least one data packet responsive to the electromagnetic signal characteristics.

44. The method as in Claim 43, further comprising:

utilizing steered directional antenna sectors to orient the directional antenna sectors.

45. The method as in Claim 43, further comprising:

arranging the directional antenna sectors in a defined physical pattern.

46. The method as in Claim 43, further utilizing:

converting the received electromagnetic signal to provide control information and data information.

47. The method as in Claim 46, wherein the control information is representative of at least one of the following: power, polarization, SNR (signal-to-noise-ratio), Doppler shift, phase shift, packet source identification, transmitting identification, base station identification, access point identification.

48. The method as in Claim 46, further comprising:

determining the electromagnetic signal characteristics by at least one of the following: analog processing, digital processing, analog filtering, digital filtering, FEC (forward error correction), bit error rate analysis, RSSI (received signal strength indicator) analysis, timing analysis, time-of-day analysis, propagation delay analysis, transmitter address analysis, communications channel analysis and transmitter identification analysis.

49. The method as in Claim 43, further comprising:

communicating the electromagnetic signal via a plurality of channels.

50. The method as in Claim 49, further comprising:

selecting at least one of the plurality of channels responsive to defined performance selection criteria.

51. The method as in Claim 50, wherein the defined performance selection criteria is at least one of the following: analog processing, digital processing, analog filtering, digital filtering, FEC (forward error correction), bit error rate analysis, RSSI (received signal strength indicator) analysis, timing analysis, time-of-day analysis, propagation delay analysis, transmitter address analysis, communications channel analysis and transmitter identification analysis.